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EXAMINER

DINH, TUAN T

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 07/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/579,649

Applicant(s)

YUEN ET AL.

Examiner

Tuan T Dinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 May 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's election without traverse of Specie I (figure 3A, claims 1-17) in Paper No. 4 is acknowledged.

Claims 18-46 are canceled without prejudice.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the structure of "the electrical traces...one or more circuit lines, claim 3" must be shown in figure 3A or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 3 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession

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of the claimed invention. The specification is silent regarding "the electrical traces...circuit lines, claim 3, lines 1-3" Does applicant mean "the traces of the substrate and the motherboard are connected by solder bumps?

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 2, lines 1-3, it is unclear. The phrase of "the density...about 40 soldered traces/inch/side" is not understood. Does applicant mean "...about 40 traces per inch per side?" Does the substrate having length about one inch to contain 40 traces per side?

7. Claim 16 recites the limitation "the molded housing" in line 2. There is improper antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-3, 6-8, 10-14, and 16-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Kinsman (U. S. Patent 6,147,411).

As to claim 1, Kinsman discloses an apparatus as shown in figures 1-7 comprising:

one or more stackable fiber optic transceivers (module 10, column 4, line 47), wherein each transceiver includes an electrical substrate (12) having two sides (12a, 12b, column 4, lines 48-49) with one or more electrical traces (14, column 4, lines 65-66) on each side terminated at an edge (15, column 5, line 1) of the substrate; and

wherein the electrical traces (14) on the substrate (10) align with one or more traces (42, column 4, line 58) at predetermined positions on a motherboard (motherboard traces),

wherein the motherboard traces is sufficiently close to a corresponding trace (14) on the electrical substrate so that melted solder (fuse bump solder 17) on one or more of the motherboard traces can wick up onto the substrate traces to form an electrical connection (see figures 3-4).

As best understood to claim 2, Kinsman discloses the apparatus as shown in figures 1-2 wherein a density of soldered electrical traces at the edge of the electrical substrate is about 40 soldered traces per side surface of the substrate.

As best understood to claim 3, Kinsman discloses the apparatus as shown in figures 1-7 wherein the electrical traces (14) on the electrical substrate and the motherboard are electrically connection.

As to claims 6-8, Kinsman discloses the apparatus as shown in figures 1-7 wherein the solder in a form of a solder paste or solder ball (see figure 3A) comprises a material selected from the group consisting of Pb-Sn (solder, column 6, line 1).

As to claims 10-11, 16, Kinsman discloses the apparatus as shown in figures 1-7 further comprising one or more molded housings (34, column 6, lines 41-57) on both sides of the substrate (10), see figure 4, for retaining solder adjacent the traces on the electrical substrate.

As to claim 12, Kinsman discloses the apparatus as shown in figure 4 wherein the molded housing (34) prevents cross connection between the electrical traces.

As to claim 13, Kinsman discloses the apparatus as shown in figure 4 wherein the molded housing (34) has alignment features that conform to alignment features on the electrical substrate.

As to claim 14, Kinsman discloses the apparatus as shown in figure 4 wherein the molded housing comprises a material selected from the group consisting of ceramic, plastic, and metal (column 6, lines 49-52).

As to claim 17, Kinsman discloses the apparatus as shown in figures 1-7 wherein one or more of the electrical substrates have alignment features that conform to alignment features on the motherboard.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kinsman ('411) in view of Sono et al. (U. S. Patent 5,574,310).

Kinsman discloses all of the limitations of the claimed invention, except for each electrical substrate are made of a material selected from the group consisting of ceramic and plastic.

Sono shows a semiconductor device (10) having a body (11) made of epoxy resin (column 4, lines 65-66).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have ceramic or plastic substrate as taught by Sono to employ the apparatus of Kinsman in order to provide a light weight and low cost for manufacture.

12. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kinsman ('411) in view of Feldman (U. S. Patent 5,742,844).

Kinsman does not disclose the electrical trace carrying data at a speed greater than 100MHz.

Feldman discloses a multi-chip module as shown in figures 1-5 wherein each electrical trace can carry data at a speed greater than 100MHz (column 7).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have an electrical trace can carry data at a speed greater than 100MHz as taught by Feldman to employ the apparatus of Kinsman in order to provide high speed transmit/receive signals of a multi-chip module.

13. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kinsman ('411) in view of Smith (U. S. Patent 5,994,781).

As to claim 9, Kinsman does not disclose the apparatus wherein the solder balls have a diameter of about 350 microns.

Smith shows in figures 1-3 comprising a substrate having a solder ball (30), the solder ball has a diameter, which is in a range 225-350 microns.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have teaching's Smith to employ the apparatus of Kinsman in order to provide an utilize of a fine pitch connection.

Allowable Subject Matter

14. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Angiulli et al., and Taniguchi et al. disclose related art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T Dinh whose telephone number is 703-306-5856.

The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-1341 for regular communications and 703-305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

TD
July 24, 2003

John B. Vigastin
John B. Vigastin
Examiner
AU 2827